Opportunities for Environmental Products and Services in Mexico

Prepared For

State of Washington
Department of Community, Trade and Economic Development

By

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Introduction

Environmental protection, management and remediation is perhaps the most critical public policy issue facing Mexico today. Mexico lagged far behind more developed countries in introducing water and waste treatment infrastructure in the twentieth century and only in recent decades has begun to develop systematic programs to protect and manage its environment and resources. The Mexican government, aware that local industry provides few advanced products and services in this area, has publicly invited foreign suppliers to market their environmental products and services aggressively in the country. While environmental management and protection applies to an extremely wide range of product and service areas, the scope of this report will be limited to the water treatment and solid waste management industries.

Mexican Market for Water Treatment Systems

Market Overview

While Mexico's water consumption per capita is similar to most European countries, the country faces two severe disadvantages: 1) natural water resources are concentrated in certain regions, leaving large areas of the country highly arid; and 2) the level of pollution control, wastewater treatment and re-use of treated water is gravely insufficient. Studies indicate that only approximately 25% of municipal wastewater and 15% of industrial wastewater receive treatment meeting environmental standards. In addition, existing treatment infrastructure in place is often outdated and in poor maintenance. Combined with increasing public and private sector awareness of the urgency of water conservation, this situation creates a growing demand and great potential for pollution control and water treatment systems of all kinds in the country.

The overall market for water management equipment in Mexico was estimated at approximately 2.5 billion dollars annually. This market includes product areas such as equipment for the treatment and distribution of potable water and municipal and industrial wastewater, sewage infrastructure for urban and rural areas and irrigation equipment. U.S. manufacturers and service providers are estimated to hold an approximately three-quarters share of this overall market. By itself, the market for imported machinery and equipment for filtering or purifying water was worth 53 million dollars in 2001, although this was a substantial drop-off from previous years due to the temporary economic slowdown at the time. The United States is by far the largest source of these imports with a 74% share, followed by Canada and Italy with 6% each. Canada is aggressively pursuing increased participation in the Mexican environmental market, having increased its exports of water treatment equipment to Mexico in 2001 while the overall market contracted strongly.

Water Treatment Plants

The market in Mexico for water treatment systems is served by a large number of companies both domestic and foreign. These range from consulting and engineering firms to equipment distributors to manufacturers. There are several Mexican manufacturers of water treatment plants competing with foreign firms on the market, most of which focus on large municipal and industrial systems. A small number of local manufacturers also build modular-type, smaller-scale treatment plants. One such manufacturer is Agua y Sanamiento Ambiental, S.A. de C.V., which manufactures prefabricated plants for hotels,

schools, housing projects and restaurants, among other applications. Agua y Sanamiento Ambiental builds its units under license from Jet, Inc. of Cleveland, Ohio. Another local manufacturer is AMDS de Mexico, S.A. de C.V., a subsidiary of Naperville, Illinois based AMDS Group, Inc. AMDS de Mexico provides package wastewater treatment systems ranging from single-home units with 3 m^3 / day flow capacity to 7,800 m^3 / day flow capacities. The Canadian manufacturer Castle Environmental also is active in the Mexican market for reduced-scale treatment plants, installing systems for applications such as steel mills and office complexes.

Household Water Purifiers

The Mexican market for home water purifiers of the type that filter and purify the water for an entire home or building is not highly developed. Point-of-use purifiers have been common in the market for the past thirty years. This market is supplied by numerous domestic and foreign brands. The principal consumers of these purifiers are the middle and upper classes of society for domestic units and the food service businesses such as restaurants. Many hotels reportedly have installed water purification systems but still provide bottled water in the rooms. The hotel and restaurant industries are aware of the health hazards posed by drinking contaminated water and are leading consumers of bottled water.

Purification of water household-wide appears to be a new concept in Mexico, based on the results of a TMS survey of approximately fifty water purification system distributors, manufacturers and middle class households. Some respondents felt that filtering and purifying the water for an entire house was unnecessary since the municipal supply is already treated. Most households surveyed had a kitchen water purifier and/or bought bottled water. When consulted for this report, distributors and manufacturers that carry large systems to service homes thought the household-wide purification concept was unusual but were willing to offer systems.

There are a small number of Mexican manufacturers of ozone and ultraviolet devices for water purification and many distributors of imported water purifiers. Mexican manufacturers of ozone water purifiers and systems include Instapura, in Cuernavaca; Industrias Generales de Ozono, in Mexico City; Aqua-Tec; Deyco in Monterrey; and Hidro-Agua, in Guadalajara. Aqua Life and Ultrapure appear to be the leading foreign brands. None of these companies reported having installed a household-scale system. The most conventional application of large water filters is for the purified water dispensers in supermarkets.

Market Access

Manufacturers of water treatment systems and equipment compete for contracts in Mexico through a variety of means. One principal marketing channel is direct sales by manufacturers. The Mexican manufacturers and incorporated subsidiaries of overseas firms have an advantage in this area by being present and able to participate in more industry events and have closer contact with existing and potential customers. Nonetheless few foreign manufacturers currently have incorporated subsidiaries in Mexico due to the cumbersome incorporation process and local fiscal obligations involved. More commonly, foreign manufacturers enter into representation relationships with local companies.

A range of options is open to non-Mexican manufacturers seeking local representation. Although distribution by a local manufacturer would seem improbable for reasons of competition, this is not necessarily so in the case of prefabricated modular units, given that the Mexican manufacturers are more oriented toward the larger municipal systems, making the residential modular systems a complimentary product. There are a large number of Mexican consulting and engineering firms specialized in design, planning and installation of treatment plants of all types. While many of these firms are not set up as sales enterprises, they do have potential as representatives since they are continually competing for contracts in which they will recommend the equipment to be used. The large number of these companies in the market and their consequent specialization in market sub-sectors gives them an advantage in target market specificity. A third option for distribution is through dedicated water treatment equipment distributors. These are most likely the largest source of imported equipment for end users in Mexico, and many are already representing foreign brands on the local market. Some of these distributors serve a nationwide market while others focus on the areas with the largest concentration of population and industry, which are the regions around Mexico City, Guadalajara and Monterrey.

Mexican Market for Solid Waste Treatment Systems

Industry Overview

Mexico generates 178,000 tons of garbage daily, only 32% of which is collected and disposed of properly, according to the Secretariat of Environment and Natural Resources (Semarnat). The rest is dumped in open sky pits or buried with few or no proper sanitary measures. Where there are no municipal services, garbage is burned or dumped in fields, ravines and rivers. Hospital and other hazardous industrial waste, when properly handled and collected, is sent to the country's sole hazardous waste confinement site.

The Mexico City metropolitan area alone generates 20,000 tons of garbage per day. The city's garbage collection trucks take trash to one of ten transfer stations, after which it is transported in larger trucks to a landfill. There are two of these landfills in the Mexico City area: Bordo Poniente, which receives 8,500 tons daily, and Prados de la Montaña, which receives 2,200 tons. Santa Catarina, a third landfill that was receiving 2,800 tons of garbage daily, recently closed. Bordo Poniente is nearly filled to capacity and will close within the next two years.

Most often, garbage in Mexico is collected and dumped in bulk with little separation of materials. According to Mexico's Department of Social Development (Sedesol), which regulates public dumps and landfills, only 35% of municipal garbage is separated after dumping for recycling or materials recovery. One contributing factor is that there are no systematic local or national programs or campaigns to separate garbage. Organic, inorganic, hazardous waste, plastic, paper, glass, metals and other materials are most often mixed and disposed of together.

As a result of the deficiencies in the organization and control of waste disposal in Mexico, the country suffers from environmental damage and low recycling efficiency. Semarnat has identified some 124 unregulated sites throughout the country that are contaminated with hazardous waste, containing more than 33 million tons of garbage. Hospital wastes are among the most dangerous contaminants at these sites. As part of its struggle to combat environmental contamination from improper waste disposal, the government

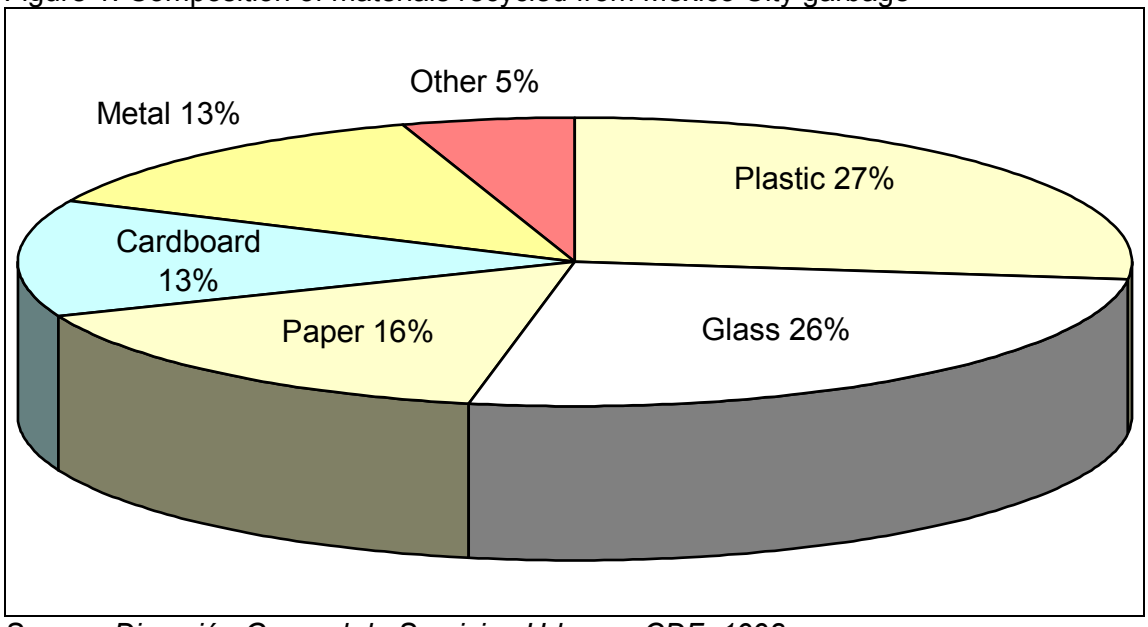
recently announced plans to construct twelve new landfills to serve cities along the U.S.A.-Mexico border.

Recycling

In the absence of formal municipal recycling programs, an informal system is used in Mexico that differs substantially from those in practice in the U.S.A. The system as it functions in Mexico City is repeated on smaller scales in other parts of the country. When garbage arrives at the landfill or dump, it is dumped in predetermined tracts which are then assigned to families of garbage sifters called *pepenadores* by a chieftain to pick and select recyclable goods. These products are then taken to a weighing station where they are stored and eventually sold to recyclable products buyers.

These *pepenador* families live within the dump itself, where entire generations spend their lives sorting through garbage. They form part of a large, informal organization of garbage sifters run by powerful bosses, who control the lives and livelihoods of the *pepenadores*. The bosses control the assigning of picking rights as well as the money generated from the labors of the pickers. A *pepenador* may earn an average of USD$20.00 daily and a weigher may earn twice as much. The leaders, in contrast, take the bulk of the profits earning as much as USD$10,000 per day. The organization bosses also wield considerable political power. The principal buyers of the materials recovered at the dumps, the National Recycling Institute (INARE), are against the control of recycling by the unregulated *pepenadores* oganization. The position of INARE, which proposes the use of garbage as an energy source, is that a well-organized and regulated recycling industry in Mexico could be worth as much as USD$15 billion per year.

Figure 1. Composition of materials recycled from Mexico City garbage



Source: Dirección General de Servicios Urbanos CDF, 1998

Compost

Municipal compost projects in Mexico traditionally have been few and, according to interviews conducted for this report, largely unsuccessful. There are reportedly five

existing compost sites in the country (Figure 2). The compost production officially reported for these sites is quite low, and in fact industry sources consulted for this report expressed the opinion that it is more likely that the output of these plants is close to or at zero. Nonetheless, the Mexico City municipal government recently announced an ambitious plan to construct 10 new composting facilities by 2006.

Figure 2. Existing compost plants in Mexico

Location	Process Capacity (tons/day)	Compost Production (tons/day)*
Mexico City	750	225
Tonala, Jal.	600	180
Monterrey, N.L.	120	0
Oaxaca, Ox	200	10
Merida, Yuc.	200	25

Source: Sedesol

* Production figures are official targets or estimates and believed to be inflated. Data is for 2002.

The Mexico City facility listed in Figure 2, built by a Japanese engineering firm, is reportedly no longer in operation. One source consulted for this report, however, described an existing model for successful micro-scale composting programs. One of Mexico City's sixteen *delegación* districts has begun a small, low-cost project using tree trimmings from the parks, manure form the mounted police stables and organic domestic waste from a local neighborhood. The compost produced will be put back into the city's parks and gardens. If successful, it is hoped that other districts and cities could emulate the project.

Advances in the implementation and success of composting operations in Mexico have been impeded by various factors. Principal among these is the fact that throughout the country, garbage is not separated for collection. For a composting operation to have any significant degree of success, the garbage would have to be separated at least into organic and inorganic materials. Attempts in Mexico to have the citizenry separate trash before collection have been rare and unsuccessful. The city of Torreon, in the state of Coahuila, launched a pilot program to separate garbage into different components. However, this campaign met with poor response and was soon abandoned. In Mexico City, where civic responsibility with regard to environmental concerns is appallingly low, such an initiative would likely achieve even less success. Nonetheless, the Mexico City government is once again beginning to promote garbage separation at the household level in anticipation of renewed efforts to change the overall waste management system in the city.

A second major obstacle to composting programs in Mexico is the firm opposition of the *pepenadores* groups, which see waste management projects as a threat to their livelihood. According to some reports there are over 100,000 *pepenadores* in the country, and their organizations are firmly entrenched in local political structures. The salaried garbage collectors, who supplement their meager income by salvaging and selling recyclable products, also add their weight to this opposition. Wresting recycling operations from these groups is a formidable task as the buyers at INARE have found in their failure to make changes in the structure of the industry.

A third consideration that does not favor the proliferation of composting is the cost. Municipal garbage composting in Mexico is not likely to pay for itself, however the

production of compost could offset some of the additional cost. Currently the cost of collection, transport and confinement of garbage in a landfill or municipal dump in Mexico are estimated to be from US$18.00 to $50.00 per ton. In comparison, the cost of collection of segregated garbage is higher because of the added expense of specialized equipment, personnel, handling and transportation. According to one study of waste confinement in Latin America, the additional requirements of segregated garbage handling increase the cost to US$60.00 to $150.00 per ton. This must be considered in the context of the prevailing wholesale price of US$50.00 per ton currently paid for natural compost in Mexico.

Market Access

The principal purchasers of solid waste management equipment and services in Mexico are municipal governments. There are also a small number of private operators of landfills. Some manufacturers and engineering consultants bidding on large contracts such as full scale waste treatment plant construction approach potential clients directly for these projects. In most cases, however, foreign suppliers find it expedient to work together with a specialized local partner to bring sales to fruition. The complex economic, social and political aspects of municipal waste management and disposal require an individual or company that is knowledgeable and experienced in local customs, procedures and politics to introduce a new concept or technology into the market. There are a small number of suppliers in Mexico specialized in providing municipal governments with equipment for services such as street cleaning, traffic control and waste collection and processing. Alternatively, there is a larger and growing pool of companies dedicated to providing equipment and engineering services specifically for water and waste management and environmental remediation. These two types of companies would be the natural potential partners for foreign environmental equipment and service providers, although ultimately the specific type of product or service is key to determining the most appropriate market entry channel.

Opportunities

The following are examples of projects or markets of the type that offer opportunities for foreign suppliers of environmental management equipment and services.

- Water resource management sources report products with strong sales prospects in Mexico include analyzers, centrifugal pumps, control valves, chemical water purifiers based on chlorine, membrane and sand filters, flow meters, measuring instruments, ion-exchangers, pressure reducing valves, diaphragm valves and reverse osmosis modules.
- Mexico's US$ 2 billion pollution control equipment and services market represents strong sales prospects for products such as equipment and instruments to measure or reduce air pollution, solid and industrial waste (toxic and non-toxic), and soil contamination. Mexico imports some USD 900 million worth of pollution equipment and instruments from U.S. manufacturers annually.
- A US$ 1 million sanitary landfill, partially financed by the North American Development Bank (NADB), will be constructed in the northern state of Nuevo Leon. Funding is earmarked in 2004 for the acquisition of land for the project as well as for the purchase of all infrastructure and equipment necessary for the facility's operation.

- The Overseas Private Investment Corporation is currently evaluating funding proposals that would include multi-million dollar projects to construct two water treatment plants in northern and western Mexico.
- The NADB distributed US$ 470 million in 2003 through the Border Environmental Infrastructure Fund for environmental projects in northern Mexico.
- The Mexico City municipal government announced in April 2004 plans to construct ten composting plants within the next two years with the objective of achieving a capacity to recycle 3,000 tons of organic waste per day.
- The NADB announced in February 2004 upcoming procurement for major upgrades to water treatment and distribution infrastructure in the city of Nuevo Laredo in the northern state of Tamaulipas.
- The Mexico City municipal government announced plans in 2004 to spend approximately US$ 4 million for the purchase of new garbage collection trucks with separating compartments. The government also plans to upgrade 13 solid waste transfer stations and three recycling plants.
- The municipal water utility in Guadalajara, one of Mexico's three largest cities, has contracted with Massachusetts-based Axeda Systems to provide software solutions for the control and automation of the city's water management.
- The southeastern resort city of Cancun has contracted with a Russian firm working in association with a Mexican partner to construct a US$ 8 million plant to convert solid waste into construction materials.

Regulatory Environment

Tariffs

There are no import tariffs on water or waste treatment equipment and systems of U.S. origin under the North American Free Trade Agreement. Mexico's Free Trade Agreement with the European Community also has eliminated import tariffs for these products of European origin.

Standards

Mexico has mandatory standards, called Normas Oficiales Mexicanas, or NOMs, applicable to certain products. Although no NOMs have been established specific to for water treatment plants, a range of NOMS exist that apply to sanitary requirements for water for human consumption and other uses. These include:

- NOM-180-SSA1-1998 (Sanitary requirements for domestic water purifiers producing water for human consumption)
- NOM-001-ECOL-1996 (maximum permissible levels of contaminants in wastewater discharged in national bodies of water).

While there are no NOMs easily identifiable specific to solid waste treatment plants, there are a range of NOMs applicable to water and other environmentally related topics. In any case, It is highly recommended that a U.S. exporter verify applicable NOMS and tariffs with a Customs broker before shipping any products to Mexico. For further product-specific information on NOMs or tariffs, consult a Customs broker or contact the Dirección General de Normas of the Secretaría de Economía included in the Key Contacts section of this report.

Import Requirements

A Mexican company that wants to import must register with the Secretaria de Economia. This is a one-time procedure that can be accomplished when the company is formally set up to do business. If importing is not included in the original description of corporate activities at the time of incorporation, the company can request an extension of its authority to operate as an importer at a later date. In either case, the company is given a registration number that should appear on import documentation, including the commercial invoice. To facilitate matters, the U.S. exporter should obtain the importer's import registration number when an order is accepted and before shipping. Failure to do so could result in delays.

Certificates

To qualify for NAFTA preferential treatment, U.S. exporters are required to include a NAFTA certificate of origin with shipping documentation. The certificate of origin should be completed and signed by the exporter and may cover a period of time up to one year.

Taxes

Taxes that will apply to industrial machinery imported into Mexico include the Value Added Tax (VAT) of 15% and the Mexican Customs processing fee of 0.08% on the value of the merchandise.

Key Contacts

Secretaria de Economia
Direccion General de Normas
Av. Puente de Tecamachalco 6
Col. Lomas de Tecamachalco
53950 Estado de Mexico
Tel. (52)(55) 5729-9300
Web: www.economia-noms.gob.mx

Secretaria de Ecologia del Estado de México
Dirección de Prevención y Control de la Contaminación
Del Agua, Suelo y Residuos
Orizaba # 7 piso 7
Edificio Auris
Col. Del Parque
Naucalpan, Edo. De México
Tel. (52)(55) 5576-8183
Fax: (52)(55) 5576-7750
Email: senormas@prodigy.net.mx

State of Mexico environmental protection bureau.

Dirección de Transferencia y Disposición Final del Distrito Federal
Diagonal de San Antonio 423
Col. Carola
01180 Mexico, D. F.
Tel. (52)(55) 5515-9789, 5515-3179
Fax: (52)(55) 5273-7363

Mexico City landfills administration.

Instituto Nacional de Recicladores, A.C. (Inare)
Retorno 8 Fray Servando Teresa de Mier no. 4
Col. Jardín Balbuena
15900 Mexico, D. F.
Tel./Fax: (52)(55) 5784-1279
Email: inare@att.net.mx
Web: www.inare.org.mx

Recyclable material buyers chamber of commerce.

Instituto Nacional de Ecología
(Subsecretaría de Gestión para la Protección Ambiental)
Av. Revolución no 1425
Col. Tlacopac San Angel
01040 Mexico, D. F.
Tel. (52)(55) 5628-0600, 5629-3542
Fax: (52)(55) 5624-3686
Email: jestevez@ine.gob.mx

National Environmental Protection Institute.

Associación Mexicana de Hidráulica (Mexican Hydraulic Asociation)
Camino a Santa Teresa 187
Col. Parques del Pedregal
14010 Mexico, D.F.
Tel. (52)(55) 5606-1167
Fax: (52)(55) 5666-0835
Email: cuellar@aguamh.com
Web: www.aguamh.com

A private non-profit organization dedicated to the advancement of hydraulic technology in México, principally scientific and professional in nature.

Association Nacional de Empresas de Agua y Saneamiento de México, A.C. (ANEAS)
(National Association of Water and Treatment Companies of México)
Xola no. 1458
Col. Narvarte, México, D.F.
Tel. (52)(55) 5530-6448
Fax: (52)(55) 5530-9621
Email: informes@aneas.com.mx
Web: www.aneas.com.mx

Professional organization for municipal water management agencies and private water treatment and management service providers.

Instituto Mexicano de Tecnología del Agua (Mexican Institute of Water Technology)
Paseo de Cuauhnáhuac no. 8532
Jiutepec, Morelos
Tel. (777) 319-400
Web: www.imta.mx

The IMTA is an institute within the Mexican government's Secretariat of Environment and Natural Resources (Semarnat) dedicated to compiling and disseminating information about water management technology in Mexico.

Industry Events

Enviro-Pro Tecomex 2004
September 8-10, 2004
Centro de Exposiciones World Trade Center, Mexico City
Info:
E. J. Krause de México
Insurgentes Sur no. 664 piso 4
Col. del Valle
03100 Mexico, D.F.
Tel. (52)(55) 5523-8426 . 1087-1650
Fax: (52)(55) 5523-8276
Web: www.enviropro.com.mx

Mexico's largest industry event for environmental products and services.

Expo Agua 2004
April 27-29, 2004
Cintermex, Monterrey, Nuevo Leon
Info:
Sociedad Mexicana de Aguas, A. C.
Porfirio Díaz 1450, Col. Pío X
64710 Monterrey, Nuevo Leon
Tel. (52)(81) 8115-0262, 8040-9317
Fax: (52)(81) 8129-3160
Web: www.smaac.org.mx/expoagua/
Email: smaac@infosel.com

An event for engineers, consultants and project managers in the water treatment and recycling industries to meet and view the latest technology and products. Over 60 exhibitors.

Industry Publications

Revista Tierra
Editorial 3W Mexico
Miguel de Mendoza 35
Col. Merced Gomez
01600 Mexico, D.F.
Tel. (52)(55) 5660-3286
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Teorema Ambiental
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01600 Mexico, D.F.
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EcoDir
Editorial 3W Mexico
Miguel de Mendoza 35
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Directory of environmental businesses and organizations in Mexico.

Agua Latinoamerica
Willow Springs Publishing, LLC
2800 E. Fort Lowell
Tucson, AZ 85716
Tel. (520) 327-6469
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Web: www.agualatinoamerica.com
Email: info@agualatinoamerica.com

Agua y Saneamiento (Water and Treatment)